DInSAR 手法を用いた氷流速度推定と GNSS 観測による精度検証

白水薫[1]、土井浩一郎[1,2]、青山雄一[1,2]、早河秀章[2]
[1] *総合研究大学院大学*
[2] *国立極地研究所*

DInSAR estimation of ice flow velocity and its verification by GNSS observation

Kaoru Shiramizu[1], Koichiro Doi[1,2] , Yuichi Aoyama[1,2] and Hideaki Hayakawa[2]
[1]*The Graduate University for Advanced Studies*
[2]*National Institute of Polar Research*

Differential Interferometric Synthetic Aperture Radar (DInSAR) is an effective tool to measure the flow velocity on ice sheet and ice streams with high ground resolution. Since ALOS-2/PALSAR-2, one of SAR sensors, is capable of acquiring SAR data in a short recurrence period (14 days), it is considered to be estimate the ice flow velocity with high temporal resolution. However, there is not much study evaluating the accuracy of the flow velocity measured by this method.

In this study, we verify the accuracy of the ice flow velocity estimated by DInSAR method and measure the temporal variation of ice flow velocity on Antarctic ice sheet and ice streams. The study area is ice sheet around Skallen in the southern part of Sôya Coast, East Antarctica.

For making DInSAR images, we used 13 pairs of ALOS/PALSAR data and 2 pairs of ALOS-2/PALSAR-2 data, obtained during the period from November 2007 through January 2011 and from April 2014 to May 2015, respectively. We used GAMMA software for the DInSAR analysis.

The accuracy verification was calculated by comparing the in-situ data by Global Navigation Satellite Systems (GNSS) observation and the estimated ice flow velocity from DInSAR method. In the 57th Japanese Antarctic Research Expedition (December 2015 - March 2016), we acquired actual values of ice flow velocity on the ice sheet and ice streams at 6 sites in this study area. The GNSS data was measured using Trimble NetRS and Choke ring antenna at 6 sites. For estimating actual ice flow velocity, we analyzed 10 second interval GNSS data by Kinematic Precise Point Positioning method using RTKLIB v2.4.2 (Takasu, 2013).

We will show the detailed results of verification of ice flow velocity measurement by DInSAR method and discuss the temporal variation of ice stream.